EXHIBIT E

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Morrison
Environmental
Engineering

August 26, 2010

Ms. Lynn Cornfield
Department of Environmental Protection
Bureau of Air Quality
17 State House Station
Augusta, Maine 04333-0017

Re: Addendum to NOx BACT Evaluation
Berwick Iron & Metal Recycling, Inc.

Dear Ms. Cornfield:

On behalf of Berwick Iron & Metal Recycling, Inc. (BI&MR), Morrison Environmental Engineering, Inc. (MEE) is submitting an addendum to the Best Available Control Technology (BACT) evaluation conducted for the proposed emissions of oxides of nitrogen (NOx).

Diesel Drive Unit

A 3600 HP 20-cylinder turbocharged General-Motors Model 3410 diesel locomotive engine is proposed to be used to provide power for the shredder. The following is a summary of the control systems proposed to meet the requirements of BACT for this engine.

BI&MR has found that a similar unit operating out of state has tracked their actual fuel use and found that they average about 45 gallons per hour. Therefore, BI&MR is now willing to accept a lower annual fuel use limit than originally proposed. BI&MR is proposing a reduced fuel limit of 150,000 gallons of low sulfur diesel fuel per year, based on an estimated average fuel use of less than 75 gallons per hour.

BI&MR further proposes to minimize peak daily and seasonal emissions by limiting operations to 8 hours per day, 40 hours per week, and 50 weeks per year, for a total of 2000 hours per year of operation. Hours will be tracked through the use of a non-resettable hour meter. Fuel use will be tracked through purchase records and inventory tracking.

Based on the revised fuel use proposal, NOx emissions would be limited to 19.5 tons per year (TPY). A review of BACT determinations for other diesel units in Maine shows that BACT is often based on the limitation of NOx to a specific ton per year value of 20 TPY or less. The proposed annual NOx limit of 19.5 TPY is consistent with this approach.

Best Available Control Technology (BACT)

For any new or modified emission unit, a facility is required to demonstrate that the unit to be constructed, reconstructed or modified will receive Best Available Control Technology (BACT). BACT is defined as an emission limitation based on the maximum degree of reduction for each pollutant emitted through the application of production processes or available methods, systems, and techniques taking into account energy, environmental, and economic impacts and other costs.

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NOx emissions from internal combustion engines are primarily reduced by optimizing combustion to limit NOx formation or by using add-on control equipment. The following is a brief description of the standard control systems considered for NOx.

Selective Catalytic Reduction (SCR) is an add-on control designed to treat the exhaust stream by injecting urea ($CO(NH_2)_2$) or ammonia (NH_3) in the flue gas. The reagent reacts with the NOx in the presence of a catalyst to form water and nitrogen. Based on a 2008 report by the California Air Resources Board, potential NOx reduction in diesel engines can range from 50% to 90%. The cost for an SCR unit for this engine is estimated to be a minimum of $180,000. There would also be additional transportation, installation, and testing cost. The annual operational costs would also include chemical usage at a total cost of about $18,000 per year. Load fluctuations are expected in this process, which can cause variations in exhaust temperature and NOx concentration and create problems with the effectiveness of the SCR system. In addition to the high cost of installation and operation, there are also environmental and safety risks that are incurred from the use of ammonia or urea. Based on these costs and considering the revised fuel use limit, the expected cost of SCR would be in the order of $5,500 per ton of NOx reduction, which is considered prohibitive for a source of this type.

Control Costs	**SCR**
Capital	$180,000.00
Ammonia	$18,000.00
Annual Cost*	$54,000.00
Percent Reduction	50%
Reduction (TPY)	9.76
Cost/ton	$5,532.08

*Annualized over 5 years

$1,542
90%
39 TPY

Selective Non-Catalytic Reduction (SNCR) is also used as an add-on NOx control, and involves the injection of ammonia or urea into the exhaust stream without the use of a catalyst. The reduction reaction typically requires ammonia injection at a point where the temperature is between 1,600-2,100 degrees Fahrenheit (°F). However, the exhaust temperature at BI&MR is expected to be 750°F; therefore, SNCR is not suitable for this application. SNCR systems using exhaust re-burn technologies exist, but are typically more expensive than SCR, and therefore are considered impractical.

Natural Gas Firing could also be considered an option for reducing NOx emissions. However, due to the operation of large pieces of mobile equipment in the confines of the scrap metal yard, BI&MR is concerned about the potential safety risks of using gas at its facility. Therefore, the use of gaseous fuel was considered impractical for this application.

Ignition Timing Retard (ITR) is an effective and reliable method of NOx control for diesel engines. This approach delays the fuel injector timing to minimize peak combustion temperature. ITR reduces NOx formation, and this is balanced against the potential for increasing CO and particulate matter (PM) emissions. Therefore, BI&MR proposes to use a type of fuel injector and turbocharger aftercooler which will help offset these limitations and improve the efficacy of ITR.

The proposed unit has been fitted with GM Ecotip fuel injectors, which are designed to improve the fuel input pattern and improve fuel efficiency. These injectors reduce visible emissions, PM, carbon monoxide (CO), and volatile organic compound (VOC) emissions significantly, compared to standard injectors. This improves the ability for retarding the timing in order to reduce NOx emissions.

Turbocharged engines use a turbine in the exhaust stream to power a separate compressor turbine in the air intake manifold. The engine that BI&MR proposes to use will be equipped with a GM/Electro-Motive four-pass aftercooler, which helps to decrease NOx formation by decreasing the combustion air temperature. The manufacturer has conducted testing showing that the four-pass aftercooler can reduce NOx emissions by 15% at full load, compared to the standard two-pass model.

<u>Proper Operation and Good Combustion And Maintenance Practices</u> help ensure proper operation of the diesel drive unit, thereby minimizing emissions. This includes controlling the shredder operations using integrated hardware and software to reduce energy usage, which will in turn reduce emissions from the diesel drive unit. The plant will be equipped with an automatic system for controlling operations such as shredder feed rate, feed roll pressure, engine throttle position, etc. By monitoring relevant variables, these controls maximize drive motor performance and control the feed rate, resulting in increased production efficiency, improved product, increased nonferrous recovery, and reduced power cost per ton. This reduced energy consumption also means that the engine fuel use will be minimized and that the loading is more consistent, reducing the potential for surging and/or lugging, thereby minimizing emissions from the drive unit.

Another important development in this generation of shredder is an improved power coupling between the drive unit and the shredder. BI&MR's proposed shredder uses a simple reduction gear to ensure that the shredder and diesel drive unit both operate at their optimum RPM range to maximize usable torque and minimize emissions. The shredder mill is expected to operate at approximately 600 RPMs, while the engine operates at approximately 850-900 RPMs.

<u>Derating</u> reduces cylinder pressures and temperatures thereby lowering NOx formation rates.The high power rating of the engine will help to prevent excessive engine lugging under load, which will help control visible emissions. Earlier shredders were often coupled with smaller engines, which could be bogged down during loading, potentially leading to concerns about visible emission. This proposed unit is expected to have sufficient power to operate more steadily, especially when used in conjunction with the automated controls described previously. This also means that for most of the time, the unit will be running at well below its maximum power rating. This will in effect de-rate the engine, which will significantly reduce NOx emissions.

Revised emissions tables showing the proposed controlled emissions are included with this letter. The proposed emissions are based on the United States Environmental Protection Agency (EPA) AP-42, "*Compilation of Air Pollutant Emission Factors, Volume I*", Table 3.4-1 for Large Stationary Diesels. The controlled NOx emissions values were based on the use of ignition timing retard. The combination of this control as well as the use of an annual fuel limit will control emissions to a level that additional add-on controls would not be economically feasible considering the type of facility and expected mode of operation.

The proposed AP-42 emission factor is 1.9 lb/MMBtu, which equates to 6.6 grams per horsepower-hour (g/hp-hr). As stated in the application, this engine hasn't been "reconstructed or modified," and therefore is not subject to 40 CFR 60 Subpart IIII. However, as a point of comparison, the proposed limit is less than the NSPS standard for similar size engines. The NSPS standard for pre 2007 engines with a displacement >10 liters per cylinder, is to meet the "Tier 1" standard in 40 CFR 94.8(a)(1). The Tier 1 standard calculated for this type of engine would be 8.6 g/hp-hr (based on its displacement of 10.6 liters per cylinder and speed rating of 900 RPM). As another point of comparison, the proposed emissions of 6.6 g-hp-hr are lower than the NSPS limit of 6.9 g/hp-hr for engines with a displacement of less than 10 liters per cylinder in Table 1 of 40 CFR 60 Subpart IIII.

In fact, the proposed emission rate in conjunction with the revised fuel limit would actually reduce emissions below what would have been obtained by installing a Tier 4 diesel engine with the originally proposed fuel limit.

Considering BI&MR's proposed configuration, and assuming a fuel use limit of 150,000 gallons per year, NOx emissions would be a maximum of 19.5 tons per year (TPY). Other units in Maine of similar size and configuration have had annual NOx limits imposed as the BACT determination, as follows:

Similar Facilities	**Licensed NOx Limit**
Merrill Blueberry	20 TPY
WPS New England Generation	20 TPY

Based on the review of other similar units and the proposed configuration, BI&MR proposes to meet the requirements of BACT by limiting NOx emissions to 19.5 TPY. Emissions are based on an annual fuel limit of 150,000 gallons per year and the use of use of "Ecotip Injectors," a "Four Pass Intercooler," and ignition timing retard.

If you have any questions or if additional information is needed, please call Alan Morrison at (207) 846-9897.

Sincerely,

Alan Morrison

Alan Morrison
Vice President

Enc: Revised Emissions Tables

cc: Mr. Robert Brenna, President, Berwick Iron and Metal Recycling, Inc.
Jay Stephens, Civil Consultants

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TABLE 1

Controlled Hourly and Annual Emissions from Diesel Drive Unit

(Revised)

Berwick Iron and Metal Recycling, Inc.

Berwick, Maine

POTENTIAL HOURLY EMISSIONS WITH TIMING RETARDED

Unit	Maximum Fuel Input (gal/hr)	SO_2 Emissions	NOx Emissions	CO Emissions	PM_{10} Emissions	VOC Emissions
Diesel Engine Emission Factors[1,2,3]		0.05 lbs/MMBtu	1.9 lbs/MMBtu	0.85 lbs/MMBtu	0.12 lbs/MMBtu	0.09 lbs/MMBtu
Typical Expected	75	0.51 lbs/hr	19.52 lbs/hr	8.73 lbs/hr	1.23 lbs/hr	0.92 lbs/hr
Maximum Rated	200	1.37 lbs/hr	52.06 lbs/hr	23.29 lbs/hr	3.29 lbs/hr	2.47 lbs/hr

ANNUAL EMISSIONS WITH LIMITED FUEL USE AND TIMING RETARDED

Unit	Maximum Expected Fuel Input (gal/hr)	Potential Hours of Operation	Potential Fuel Usage (gal)	Potential SO_2 Emissions	Potential NOx Emissions	Potential CO Emissions	Potential PM_{10} Emissions	Potential VOC Emissions
Diesel Engine Emission Factors[1,2,3]				0.05 lbs/MMBtu	1.9 lbs/MMBtu	0.85 lbs/MMBtu	0.12 lbs/MMBtu	0.09 lbs/MMBtu
Diesel Engine	75	2000	150,000	1,027.5 lbs	39,045.0 lbs	17,467.5 lbs	2,466.0 lbs	1,849.5 lbs
Total Emissions in lbs				1,027.5 lbs	39,045.0 lbs	17,467.5 lbs	2,466.0 lbs	1,849.5 lbs
Total Emissions in tons				0.51 tons	19.52 tons	8.73 tons	1.23 tons	0.92 tons

1. SO2 emission factor based on mass balance calculation assuming a fuel sulfur content of 0.05%.
2. NOx, CO, PM10, and VOC emission factors based on EPA AP-42, *Compilation of Air Pollutant Emission Factors, Volume I*", Table 3.4-1 for Large Stationary Diesels
3. Potential emissions based on proposed license limit of 2000 hours of operation per year, and "typical" expected fuel use rate.
4. Diesel Heating Value assumed to be 0.137 MMBtu/gal.